

Fermilab's Role

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Cost and Schedule Review of Fermilab E906 Magnet
and Spectrometer Upgrade

Argonne National Laboratory
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Outline

- Fermilab Stage I Approval of E906
- Fermilab Review of Stage I Approval
- Fermilab Request
- Fermilab Task Force Report
- Summary and Final Comments

Fermilab Stage I Approval of E906

In a letter to the spokesmen of E906 on November 26, 2001, Fermilab Director Michael Witherell quoted the PAC recommendation to him:

This experiment proposes to extend the measurement of antiquark distributions to higher values of x , and to measure their A dependence. The proposal builds on the successful experiment E-866, which clarified the isospin asymmetry of the parton sea. The results of P-906 would be valuable for our understanding of nucleon structure. The collaboration has a good track record and the proposed experimental setup is well thought out.

...

Although the Committee would like to see this experiment scheduled, it must be assigned a low priority within the Laboratory's program. Indeed, any experiment that requires slow spill and a substantial number of protons conflicts directly with collider operation. Moreover, while the scientific merits of this experiment justify its incremental cost of approximately \$500K, they would not justify the full cost to the Laboratory of mounting a fixed target program.

Fermilab Review of Stage I Approval

The initial approval assumed things about the future Fermilab program which have changed since 2001. This led the Director in October, 2006, to ask his Physics Advisory Committee to review the E906 approval.

Following the PAC recommendation Director Oddone wrote to E906 on November 6, 2006

I am pleased to say that the PAC reaffirmed the previous judgment which led to Stage I approval, and, noting that the physics case for the experiment remains strong, recommended that you and the Laboratory proceed with plans to run the experiment.

Fermilab Request

Continuing in his letter of November 6, Oddone wrote:

In order to proceed, we need to define the costs for Fermilab to establish the beam, install the equipment, and operate the experiment. I am requesting that you work with the relevant Fermilab Divisions to elaborate on the impact statements so as to establish confidence in the cost estimates.

Fermilab Task Force

Estimated Cost to Mount E906

David Christian, PPD – Experimental Physics Projects Department (Chair)

Craig Moore, AD - External Beamlines Department

Richard Coleman, AD - External Beamlines Department

Charles Brown, AD – External Beamlines Department

Leon Beverly, PPD – Site Department

Douglas Jensen, PPD – Neutrino Department and Test Beam Liaison

Jim Kilmer, PPD – Mechanical Department

Bob DeMaat, PPD – Electrical Engineering Department

Hogan Nguyen, PPD – Technical Centers Department

Keith Schuh, ES&H – Building Management Service

Peter Cooper, CD – Computing and Engineering for Physics Applications

Fermilab Task Force Report Summary

A Fermilab effort and cost Task Force has compiled a detailed break-down of the estimated effort and cost for the installation of E906 in NM4 (“KTeV Hall”) and Meson West – the two potential sites for E906.

They have also estimated the cost and effort required to be able to bring the necessary beam to E906 in NM4.

No decision about which site would fit the overall Fermilab program has yet been made.

Detector-Related Cost Estimates

Without contingency or G&A costs.

	NM4 (KTeV Hall)		Meson West	
	M&S	Labor	M&S	Labor
Analysis Magnets	\$ 90,444	\$ 48,576	\$ 160,883	\$ 69,976
Cryogenics (including new targets)	\$ 181,500	\$ 165,916	\$ 181,500	\$ 165,916
Gas system	\$ 125,000	\$ 145,040	\$ 175,000	\$ 145,040
Services for analysis magnets	\$ 78,900		\$ 115,000	
Magnetic field mapping	\$ 22,000		\$ 22,000	
Shielding	\$ 50,000		\$ 90,000	
Services for detector electronics	\$ 35,000		\$ 40,000	
Area preparation	\$ 52,050	\$ 59,400	\$ 50,000	
Detector refurbishment	\$ 10,000	\$ 13,920	\$ 10,000	\$ 13,920
PREP electronics	\$ 20,000	\$ 20,160	\$ 20,000	\$ 20,160
Total	\$ 664,894	\$ 459,462	\$ 864,383	\$ 415,012

Costs for Beam Line to NM4

Without contingency or G&A costs. An estimate of the labor contingency is 25%.

	M&S	FNAL Labor
Mechanical	\$255,750	\$164,520
Electrical	\$ 82,000	\$ 71,200
Total	\$337,750	\$235,720

Summary and Final Comments

Stage I approval was confirmed by the Fermilab Director following PAC review. We would like to be able to mount the experiment.

It is encouraging that the recent, more-detailed study of the impact of mounting the experiment is resulting in estimates very much in line with the earlier ones.

The scales of both the purchases (M&S) and effort (SWF) are relatively modest, but not trivial given the current 2007 budget and potential continuing resolution.

We expect that the costs for detector installation are for 2008 and 2009, but that doing some of the beamline work in the 2007 shutdown would be advantageous.

The President's 2008 Budget Request might be informative.

We are in the middle of our Division Level budget reviews now. We really need to see all of these and our reactions to them over the next few weeks. We would like to target March 2007 for a definitive decision on Stage II Approval or not.